DOCUMENT RESUME

ED 462 943 IR 021 101

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TITLE	Teaching and Learning with Information and Communication Technology: Success through a Whole School Approach.
PUB DATE	2001-06-00
NOTE	11p.; In: Building on the Future. NECC 2001: National Educational Computing Conference Proceedings (22nd, Chicago, IL, June 25-27, 2001); see IR 021 087.
AVAILABLE FROM	For full text: http://confreg.uoregon.edu/necc2001/program/.
PUB TYPE	Reports - Evaluative (142) -- Speeches/Meeting Papers (150)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	Case Studies; Computer Uses in Education; Educational Technology; Elementary Education; Financial Support; Foreign Countries; *Information Technology; *Instructional Improvement; *Learning Strategies; Models; Outcomes of Education; *Teaching Methods; *Technology Uses in Education; *Telecommunications
IDENTIFIERS	New Zealand; *Technology Implementation

ABSTRACT

This paper reports on research carried out through a case study which sought to identify how institutionalized teaching and learning practices and processes--"the way we do things around here"--led to successful teaching and learning with information and communication technology (ICT) at a large contributing New Zealand primary school (700 students aged 5 to 11 years). The research findings were considered against the backdrop of the international literature, historical trends, and current educational conditions for New Zealand schools in relation to ICT. A major contention of this research is that government funding for ICT in schools should be linked to demonstrable improvements in student learning outcomes. The research also contends that immediate adoption of "practised and proven" approaches already existent in some schools would help many other schools improve teaching and learning with ICT in their respective learning communities. The paper presents a model for school-wide implementation of ICT; major components of the model include student learning, infrastructure, pedagogical, monitoring, implementation, teacher education, and management. (MES)

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Teaching and Learning With Information and Communication Technology: Success Through a Whole School Approach

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Key Words: teaching and learning with ICT, whole-school implementation, student learning outcomes, a model for real success

This paper reports on research carried out through a case study which sought to identify how institutionalized teaching and learning practices and processes—'the way we do things around here'—led to successful teaching and learning with information and communication technology (ICT) at a large contributing New Zealand primary school (700 students aged 5 to 11 years). The research findings were considered against the backdrop of the international literature, historical trends, and current educational conditions for New Zealand schools in relation to ICT.

The research established three important questions which must be asked (and answered) if successful school-wide implementation of teaching and learning with ICT is to be achieved: *Why* does the school believe it should teach and learn with ICT? *What* student learning with ICT is proposed to occur? *How* can the processes and practices of teaching and learning with ICT be put into place?

The research questions were designed to uncover the elements of teaching and learning with ICT at the case study school (Central School). However, these questions led on to others concerning funding for, and research into, teaching and learning with ICT in schools. A major contention of this research is that Government funding for ICT in schools should be linked to demonstrable improvements in student learning outcomes. The research also contends that immediate adoption of 'practised and proven' approaches already existent in some schools would help many other schools improve teaching and learning with ICT in their respective learning communities.

Why Teach and Learn With ICT?

Schools need to be clear about the reasons they are teaching and learning with ICT. There needs to be a philosophical base, a rationale, underlying their decisions and approach. Most importantly, schools must ask what they are trying to achieve with, for and by their students in regard to ICT learning. Any one or a combination of the rationales developed by Pelgrum and Plomp (1993), and summarized by Brown (1997): vocational, economic, commercial, marketing-related, cost-effectiveness-related, social, 'transformational', and pedagogical may appeal to schools, or they may develop their own rationales. But the key question must always be: "Are the interests of our students being served?"

Central School built its approach to teaching and learning with ICT on a set of agreed aims and objectives for students and developed its rationale for teaching and learning with ICT by consulting with staff, parents and students. The school then legitimized the intentions of the learning community within the school's charter. Thus, a foundation was laid on which the learning community of Central School had clearly established its shared purpose and set its expectations

regarding ICT teaching and learning, and the provision of ICT-related experiences and opportunities for all students.

What to Teach and Learn with ICT?

In the absence of any set ICT curriculum and with the aid of only recently established, non-specific national directions (Ministry of Education, 1999), New Zealand schools have been left to either reinvent what others are doing successfully or simply drift along. A major contention of the research relating to this paper is that schools must take responsibility for teaching and learning with ICT. Therefore, schools must be clear about what they expect their students to achieve with ICT, so that at some point the school can answer the following questions: Where its students were? Where they are now? Where are they going?

Central School committed itself to a pedagogical approach that sought to create, establish and build ICT learning outcomes with and for students. As a result, a very clear set of learning outcomes with ICT has been established for its students. Furthermore, if staff members are to be competent and confident with ICT, they must also be familiar with what is expected of students. Professional development at Central School focuses primarily on developing this familiarity, while also extending staff skill and knowledge to enable further application of ICT with students. The research also highlighted the ICT teaching and learning documentation developed by Central School and it reports, through the participants in this process, on the implementation of the intentions outlined in these documents. The research revealed a resounding concurrence between parents, staff and students as to what they are doing collectively with ICT.

It was considered important that the school's ICT teaching and learning rationale, as well as its ICT practices and processes, continued to be the focus of ongoing sharing of experiences and ideas amongst staff. A number of means through which this sharing and discussion of ideas at Central School were identified included: new staff induction processes; in-school staff development; staff sharing and discussion at staff meetings; and the 'buddy teacher' process. The greatest strength noted within Central School's ICT culture is the collective consideration, agreement, review and renewal by staff of the school's ICT teaching and learning rationale, practices and processes.

How to Teach and Learn With ICT?

Schools that have agreed on *why* to do something and have established the thrust of *what* to do should then be in a position to consider *how* to go about the process of actually doing it.

This situation is not unlike preparing for and going on a journey. There is agreement on a destination and the reasons for the journey to be taken. There is a need to map out the route in advance. There is the process of looking for signposts that should confirm, for all concerned, that they are headed in the right direction and will ultimately arrive at their destination.

As a learning community, Central School identified a destination with an agreed reason for wishing to arrive at that destination. Most importantly, perhaps, the school *documented* these elements of their journey with ICT. It also constructed an explicit set of signposts in the form of graduated learning outcomes. These elements have all been translated into the parameters within which teachers must manage teaching and learning processes with ICT and provide learning opportunities and experiences for their students.

Central School may not have the best answer for its students, but it has an answer that is working. The school continues to openly presents the *why*, *what* and *how* elements of its processes and practice with ICT to others.

A Model for School-Wide Implementation of ICT

The following Figure 1 presents an overview of the ICT teaching and learning in application model operating at Central School. The model identifies all the elements that support and build the successful implementation of school-wide achievement in teaching and learning with ICT.

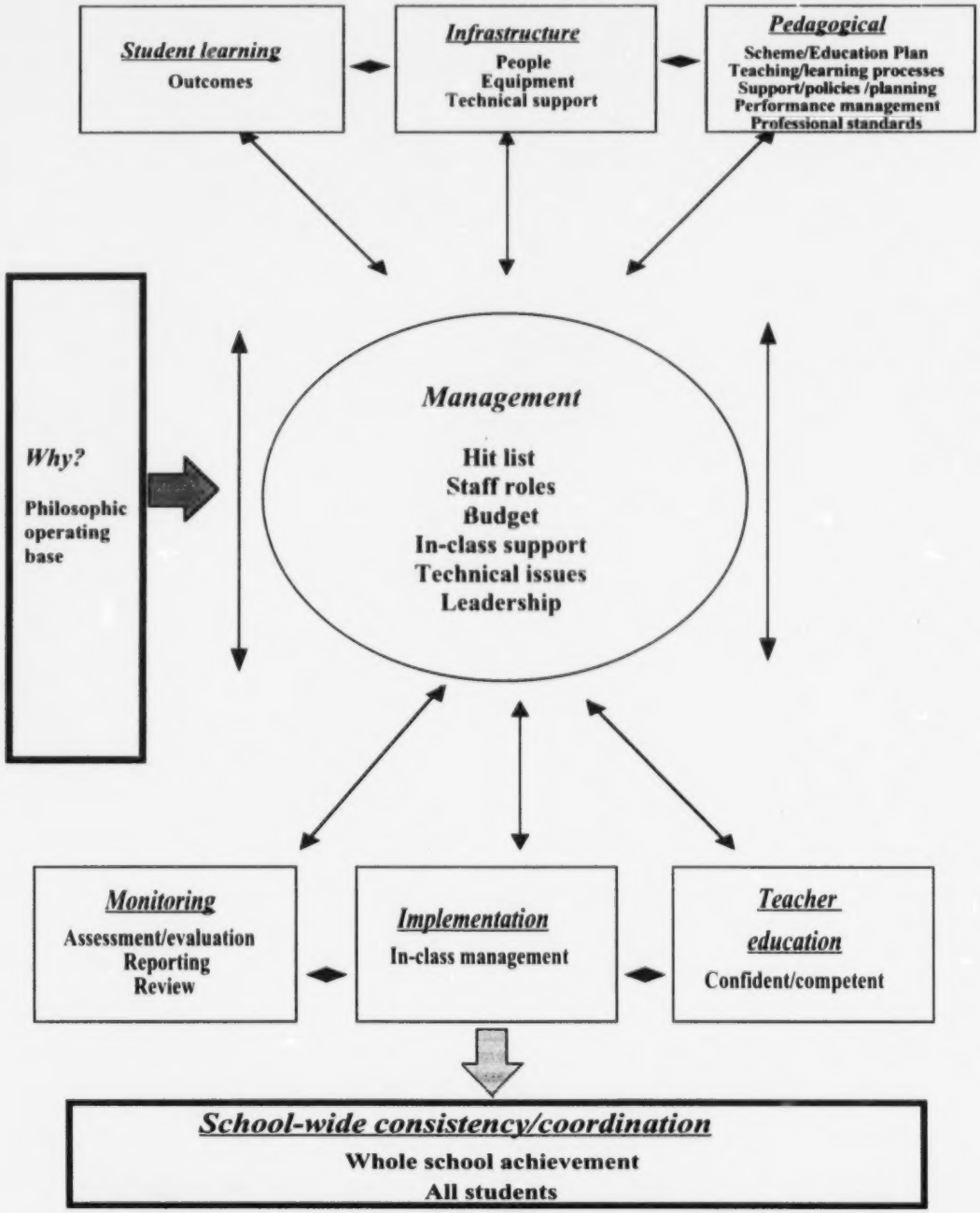

Figure 1: Model of inter-related elements for school-wide implementation of teaching and learning with ICT.

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Student Learning—The research shows that student learning is a key outcome with ICT. Indeed, the approach to teaching and learning with ICT at Central School is built on and around student learning. All planning and action considers the interests of the students. While this may seem alarmingly obvious to most teachers, the primary emphasis of ICT in many New Zealand schools, and indeed the historical focus of the Ministry of Education, has been on teacher professional development.

By concentrating on student learning outcomes, Central School has been able to establish agreed signposts for its 'ICT travelers' as they go about their journeys of discovery. By setting out its intentions for students, Central School has been able to delineate a set of skills to be acquired and a series of applications that allow students to demonstrate their skills in a meaningful context. The school has also specified its intention to develop learners who can process information and learn independently through ICT modalities. Thus, learning with ICT is not considered to be an end in itself. Rather, it is considered to be a means of fostering meaningful communication, creativity, design and problem solving.

Infrastructure—The research identified a continued emphasis by New Zealand and international schools on access to equipment as the most important determinant of implementation of teaching and learning with ICT. There is no question that, in the absence of hardware equipment, little can be achieved with ICT. However, the amount of equipment the school has is not the primary determinant of success.

The concept of 'human infrastructure', however, is of greatest importance to Central School. While equipment helps facilitate the processes of learning, *people* make all of the processes work. Whatever the level of equipment infrastructure, any school-wide implementation of teaching and learning with ICT is unlikely to succeed without the 'human infrastructure' in place and working.

Technical support is another important issue. Too many breakdowns in equipment guarantee an eventual breakdown in teacher patience and enthusiasm. When the complexity of possible problems with computers is added to the wide range and number of users, there is no doubt that technical problems will occur. For the past three years, Central School has invested in a technical solutions programme that has cut down the 'fix it' time, such that it is very unusual that equipment needs to be taken off site, and even more importantly prevented many previously 'regular' breakdowns from occurring at all. Furthermore, and as a result of using this programme, the school has been able to reduce its total maintenance budget and free up teaching staff who were previously required to give up their time trying to fix problems about which they had limited knowledge. Even worse, these teachers would often inadvertently exacerbate the problem. The need for schools to ensure ongoing and effective technical support must be built into any ICT budgeting process.

Pedagogical—In keeping with the student-focused approach at Central School, clear emphasis has been placed on attending to pedagogical issues. Having an agreed, documented, consistent school-wide approach to teaching and learning with ICT ensures that staff are clear about what to do. However, while the specific purpose and outcomes for students are clearly documented, there is also scope for variation so that staff can make the journey fun, as well as challenging and meaningful.

Central School has made the teaching and learning with ICT a compulsory part of what it offers all students. This is seen by parents and staff to be a significant factor in ensuring school-wide and consistent implementation of ICT. Essentially, the school has assumed responsibility for this in the absence of any Government directive. Central School has shown that it is not prepared to leave teaching and learning with ICT to chance, and has accorded ICT the importance of other learning areas already made compulsory by the Government through National Curriculum statements (Ministry of Education, 1994 and 1995).

Central School has singled out ICT as a specific area for teaching and learning as opposed to taking the view that ICT should be integrated. There is clear evidence in school documentation and from staff 'voices' that ICT is used across the curriculum and can therefore be considered to be integrated. Indeed, Central School treats ICT in a similar fashion to reading. Both learning areas can be considered as tools for learning across the curriculum. Yet at a primary or elementary school level, the teaching and learning of reading is considered a subject in its own right, in which students are expected to master a series of skills to be put into a series of meaningful applications. Students are encouraged to process information, to create, enjoy and design as they go about making sense of their world through reading. The learning community of Central School has decided that ICT must be afforded similar importance to reading and applied in practice within similar operating parameters.

Leaving teaching and learning with ICT to chance, or suggesting that ICT be simply integrated into what schools are already doing, often consigns any aspirations for school-wide implementation of ICT teaching and learning to the scrapheap. The focus for schools must be pedagogical, not technological.

Monitoring—All schools that aim for student achievement with ICT should extend their monitoring practices to cover student ICT learning outcomes. Moreover, parents and the wider school community have a right to know how any ICT funds have been used and the extent to which successful achievement of ICT learning outcomes with their children has resulted from the use of these funds. The research clearly indicated that Central School could present and validate such data through its monitoring processes.

Implementation—One of the most difficult tasks for teachers is managing teaching and learning with ICT in their classrooms. Teachers at Central School are able to learn quickly from others, to discover what works for them and what does not. They can look at processes and practices in place in other classes. They can present and share ideas in small and large groups. They have access to in-class support for problem solving and development. They have 'buddy teachers' to work with, access to an active ICT team, and are part of a staff whose members are all involved in the pursuit of similarly agreed goals and objectives. They have a computer in class, shared computer work stations between three classes and a computer suite for whole class teaching and learning all bound together through a base of agreed student learning outcomes and facilitated through a vibrant and dynamic school intranet. It is a whole school approach that brings about and complements the daily reality of teaching and learning with ICT for all teachers, that is, managing learning with their students in their classroom and beyond the school.

Teacher Education—While professional development is an important element in the process of implementing teaching and learning with ICT, such development should be in response to *why* schools are teaching and learning with ICT, *what* the schools are intent on achieving with and by students, and *how* the management of ICT processes and practices could occur.

Central School presents a wide variety of professional development options, both in terms of content and approach, to its staff. The content focuses on what is expected to take place with students. Part of this content focus requires staff to master the learning outcomes of the student 'certificate programme content'. Examples of professional development include: one-off sessions for large and small groups, usually out of classroom teaching time; individual tutorials from ICT team members; 'just in time' assistance, (that is, at the time the need occurs) from an ICT 'buddy teacher'; and in-class coaching from the ICT coordinator. Staff consider in-class coaching and the time made available through the school for the coordinator to carry out her role and responsibilities to be major contributors to the successes enjoyed with ICT at Central School.

The successful implementation of teaching and learning with ICT at Central School is once again a result of the focus on students by the people charged with making teaching and learning with

ICT work. Shared responsibility of professional development for, with and by teachers at Central School is a key.

Management—All elements of the model presented in the figure are interrelated. The elements all serve the needs of the students at Central School, and removal of any one of these would result in an end to the successes the school enjoys with ICT. The elements are complementary; they contribute collectively to the continued development and improvement of learning with ICT for and by students.

The processes of management with ICT at Central School provide the 'oil and glue' for the operation. Managing the process involves oiling the elements such that movement continues to take place throughout the school. Management must also provide the glue that ensures the elements hold together in a relationship that allows complementary development to take place.

Central School has an ICT (management) team charged with a range of responsibilities for ensuring that the 'oil and glue' operates in practice. The team attends to planning issues, budgeting, equipment distribution, maintenance, professional development and documentation. Its role is often reactive and 'hands on'. However, another major part of the ICT management team's role is to inform, advise and lead. To this end, the team is proactive, looking to future developments for the school through the provision of professional development, equipment and new ideas. The team's leadership role requires it considers immediate and medium term issues as well possible distant changes on the horizon. The team also serves as an agent of change within the school. Importantly, the ICT team is comprised of practising classroom teachers and administrative staff members with a range of experience with ICT. Team members are able to test ideas and often represent the best means within the school of effecting change because they understand both ICT and the real world of the classroom.

The case study research demonstrated that Central School utilises a range of ICT teaching and learning elements and management skills, all founded on an agreed operating base, to bring about identifiable school-wide achievement with ICT for all its students.

Implications of the Research

Schools

The major aim of the research presented in this paper was to identify key elements of the case study school that are responsible for the successful implementation of teaching and learning with ICT in that school. It is contended that those elements that contribute to successful implementation of ICT in the case study school may be applicable, with similar outcomes, to other schools. To this end, the researcher has identified a number of points which schools should address when considering the future implementation of teaching and learning with ICT at their schools. These are as follows:

Why	Establish agreed reasons in the learning community as to why the school is teaching and learning with ICT.
What	Develop a range of learning outcomes for student achievement with ICT.
How	Provide clear management guidance relating to the implementation of practices and processes that support the provision of ICT learning opportunities and experiences.
Responsibility	Take responsibility for students' learning with ICT, rather than wait for external requirements to be handed down.
Compulsion	Make ICT a compulsory learning area.

Leadership	Provide leadership at the top and encourage leadership in all participants.
Management	Maintain both the flexibility ('oil') and inter-relatedness ('glue') of the complementary elements of teaching and learning with ICT.
Change	Expect, be aware of, and manage the daunting but very necessary processes of change with, for and by people.
Expectations	Agree upon and set high expectations for all - especially the students - involved in teaching and learning with ICT.
Staff Confidence	Recognize the importance of staff confidence and competence with ICT for bringing about change and coping with the stresses change will undoubtedly present.
Teacher Education	Ensure professional development for staff is school-based and designed to help the school implement its processes/achieve its goals for students.
Student Awareness	Ensure that students are aware of what the school wants them to achieve, both in the immediate and long term.
Independence	Aim for students to become independent learners with ICT who are aware of the learning process and have the skills to apply it.
Documentation	Initiate, develop and review documentation that outlines and supports the agreed school-wide processes associated with teaching and learning with ICT.
Infrastructure	Be aware that ICT 'human infrastructure' is more important than equipment infrastructure.
Technical Support	Ensure that technical support is part of ICT processes and practices.
Monitor/Report	Plan, assess, evaluate and report on student achievement with ICT to parents and your school's governing authority.
Review	Establish tools for reviewing current processes in order to guide future development.
Communicate	Keep all members of the learning community informed about developments and regularly revisit the agreed elements of the plan.
Costs	Be aware of the human, financial and time costs; this will help ensure that the huge investment into ICT can and will pay off for students.
Whole School	Ensure sure that *all* students and staff are learning with ICT.

As major stakeholders in the processes of teaching and learning, principals and governing authorities must take responsibility for ensuring that their learning community is moving in a considered manner towards the successful implementation of teaching and learning with ICT. Principals must coordinate all people in the learning community and inspire them to achieve success with ICT by their students. They must have the desire to bring about the necessary changes and be prepared to take bold, albeit measured action when appropriate. They also must win the confidence of their staff by giving staff members the responsibility to take ownership of the change process. There will undoubtedly be difficulties and casualties along the way. However, if students' needs are kept at the forefront, and an agreed rationale for action is in place, principals will find that bringing about changes in teaching and learning with ICT can be achieved.

Governing authorities should consider their role in relation to teaching and learning with ICT. Generally, they are responsible for the development and approval of policy and practice in their respective schools. They are required to approve the school's budget and are entitled to receive

information about the primary purpose of their school, that is, the progress and achievement of student learning. However, the focus of governing authorities should be on governance, rather than considering which brand of hardware to purchase and at what cost. These authorities need to ensure (via their principal and staff) that all elements are in place, and that all students in the school not only have access to learning experiences and opportunities with ICT but that they also achieve and make progress with such learning.

A learning community that is determined to bring about change and implement or further develop teaching and learning with ICT in its school should find these goals easier to achieve if it utilizes the elements in practice at Central School.

Summary

This paper reviews the main findings of the research carried out at Central School. The main message of the research is that schools must consider: *why* they include teaching and learning with ICT in the curriculum; *what* outcomes, through learning experiences and opportunities, they intend for their students; and *how* the processes and practices of teaching and learning with ICT should be implemented. The focus of the research carried out at Central School has been firmly placed on student learning. All elements of the research have been filtered through the question: "How does/will this serve our students?"

A model of the interrelated elements of the school-wide implementation of teaching and learning at Central School has been presented and discussed. The model emphasizes the importance of recognizing the complementary nature of its elements, and the need, through management, to ensure each element is in motion while maintaining its dynamic relationship with other elements.

The research has important implications for schools, governing agencies of schools and perhaps for education communities worldwide. The researcher contends that schools, through their principals and governing authorities, must take greater responsibility and become more accountable for student learning with ICT. To this end, a range of ICT teaching and learning issues has been listed for the consideration of schools. The researcher also suggests that the governing authorities must move more quickly to recognize the importance of student learning with ICT. Immediate research conducted at schools already known to be successful providers of teaching and learning with ICT is required. Such research is likely to form the basis of far more meaningful information for schools and governing authorities, and more specific directives in ICT teaching and learning. We are not likely to obtain the information we need, that is, what we should be doing in ICT with our students today and in the future, through any other method.

In conclusion, the research identified how one school, in a typical urban setting, has taken responsibility for teaching and learning with ICT. The research presents and interprets the compelling reports and experiences of the people of the Central School ICT learning community. Their stories, their voices, their data, and their teaching and learning in practice provide a rich account of the 'way they do things' with ICT. But when all is said and done the key to success in this field are the people involved in leading, managing and changing the processes and practices of teaching and learning with ICT. If the 'human infrastructure' is in place, and the ultimate goal of successful student learning remains paramount, it should be possible for any school to adopt and apply the elements of teaching and learning with ICT observed at Central School, with the same successful outcomes.

References

Brown, M.E. (1997). "Educational Technology: I've Been Thinking" in *Computers in New Zealand Schools*. March 1997.

Brown, M.E. (1995*). Learning and Computers: A study of proficient Computer - Using Teachers.* Master of Education Thesis. Palmerston North: Massey University.

Ministry of Education (1994). *English in the New Zealand Curriculum.* Learning Media, Wellington.

Ministry of Education (1995). *Technology in the New Zealand Curriculum.* Learning Media, Wellington.

Ministry of Education (1999). *Information and Communication Technologies in schools: One-off grant and ongoing funding.* Education circular No. 20. Wellington: Ministry of Education.

Pelgrum, W and Plomp, T. (Eds.) (1993). *The IEA Study of Computers in Education: Implementation of an Innovation in 21 Education Systems.* Oxford: Pergamon Press.

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